Complete Summary

GUIDELINE TITLE

Blood transfusion: indications and administration.

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Blood transfusion: indications and administration. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2008 Jan 10 [Various].

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Blood transfusion: indications and administration. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2006 Aug 8 [Various].

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Symptomatic chronic anemia
- Acute bleeding

GUIDELINE CATEGORY

Treatment

CLINICAL SPECIALTY

Family Practice
Hematology
Internal Medicine
Nursing

INTENDED USERS

Clinical Laboratory Personnel
Health Care Providers
Nurses
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collects, summarizes, and updates the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given recommendations.

TARGET POPULATION

Patients in primary care settings who have with symptomatic chronic anemia or acute bleeding

INTERVENTIONS AND PRACTICES CONSIDERED

1. Determining need for red blood cell (RBC) transfusion based on hemoglobin concentration and symptoms
2. Treatment of acute bleeding
    - Volume replacement with physiological saline
    - Phenotyped RBC products
    - Washed cell products (platelets and RBCs)
    - Irradiated blood cell products
3. Procedures for transfusion of blood products: RBCs, platelets, fresh frozen plasma
    - Collection of blood for grouping and compatibility testing
    - Checking procedures prior to transfusion (verifying patient identification, ensuring suitability of the product for the patient, ensuring integrity of the product)
    - Administration of blood transfusion (timeliness, temperature checks, filters, administration sets, record-keeping)

MAJOR OUTCOMES CONSIDERED

Transfusion reactions

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the Database of Abstracts of Reviews of Effectiveness (DARE). In addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Classification of the Quality of Evidence

Code	Quality of Evidence	Definition
A	**High**	Further research is very unlikely to change our confidence in the estimate of effect. • Several high-quality studies with consistent results • In special cases: one large, high-quality multi-centre trial
B	**Moderate**	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate. • One high-quality study • Several studies with some limitations
C	**Low**	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate. • One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain.

Code	Quality of Evidence	Definition
		• Expert opinion • No direct research evidence • One or more studies with very severe limitations

GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team).

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

In General

- In primary care, a blood transfusion is usually only administered in the treatment of symptomatic chronic anaemia where no specific treatment is available.
- It may also be necessary to use various blood products in cases of acute bleeding.

Indications for a Blood Transfusion

Red Blood Cell Transfusion in Chronic or Slowly Developing Anaemia

- It is not possible to give an exact haemoglobin (Hb) value below which a red blood cell infusion is indicated since the need for a transfusion is based on the patient's underlying illnesses and symptoms.
- Most patients will suffer uncomfortable symptoms if the concentration of Hb falls below 7 g/dL (70 g/L).
- Even a less significant fall in the Hb concentration may cause symptoms in patients with heart or pulmonary disease. An Hb concentration of 10 g/dL (100 g/L) is usually needed to safeguard an adequate oxygen transport.
- Transfusions of red blood cells are not routinely recommended for the correction of anaemia in patients with malignant disease or serious chronic disease unless the correction of Hb concentration is expected to significantly improve the patient's condition and independence.

Treatment of Acute Bleeding

- Volume replacement is the most important first aid measure in acute bleeding. This can be achieved, for example, with physiological saline (0.9% NaCl).
- The general condition of the patient and his/her underlying illnesses should be taken into account when assessing the need for red blood cell transfusion. The Hb concentration is only one of many criteria when assessing the extent of the bleed and the condition of the patient.
- In patients with ischaemic heart disease, an acutely reduced oxygen-carrying capacity may increase the risk of myocardial infarction.
- In prolonged bleeding, it may be necessary to administer platelets and clotting factors.

Choosing a Blood Product in Special Cases

- All blood products are now filtered; (i.e., they are leukocyte-depleted.)
- Phenotyped red blood cell products (i.e., products where all the blood-group antigens that may have significance for blood transfusions are extensively identified) are used in patients who have developed clinically significant red blood cell antibodies as a result of previous transfusions or pregnancies.
- Washed cell products (platelets and red blood cells) are used in patients with confirmed deficiency of immunoglobulin A (IgA) (serum IgA <0.05 mg/L). Regular frozen plasma or plasma products that contain IgA should not be administered to these patients.
- For patients with recurrent severe allergic-type adverse effects (e.g., fever, generalized urticaria and/or dyspnoea) after red cell or platelet transfusions, washed cell products should preferably be used for transfusion.

- Irradiated blood cell products are used to prevent graft-versus-host reactions in immunosuppressed patients (e.g., after stem cell or bone marrow transplantation and in small premature babies).

Transfusion of Blood Products (Red Blood Cells, Platelets and Fresh Frozen Plasma)

The Collection of Blood for Grouping and Compatibility Testing (Cross Matching)

- Verify the identity of the patient.
    - Ask the patient to state his/her own identification details.
    - If necessary, check them against the patient's identity wrist band, and
- With the exception of an emergency transfusion, the collection of a blood sample for blood grouping and red cell antibody screening and the collection of a second sample for blood group checking and compatibility testing should be taken at different times by two different people. This procedure will ensure that the patient's identity is correctly verified and that the samples are taken from the correct person.
    - The transfusion of fresh frozen plasma or platelets does not require compatibility testing, but the blood group of the patient should be confirmed.
- The blood samples should be stored in a refrigerator; the samples will remain suitable for compatibility testing for up to five days from the time of collection. Also the transfusion itself should be performed within this time frame.

Checking Procedure Prior to Transfusion

- Verify the identity of the patient (see above).
- Ensure that the product is suitable and intended for the patient.
    1. The patient's identification details must match with the identification details of the laboratory form.
    2. The blood group of the product to be transfused must correspond with the patient's blood group.
    3. Before a transfusion of red blood cells, check the result of the compatibility testing and verify that the correct product and patient was used for the test (i.e., the numbers on the red blood cell unit and its compatibility test tubing correspond to the numbers on the compatibility form issued by the laboratory.
- If the patient has red cell antibodies, ensure that the label on the red blood cell unit states the absence of the antigens corresponding to the antibodies detected in the patient.
- Examine the blood product carefully.

    1. The integrity and cleanliness of the container.
    2. The presence of clots, aggregates or gas, or a black-red colour of a red blood cell product are suggestive of bacterial contamination.
    3. In a platelet product that is in proper condition, the platelets swirl when inspected against light ("angel curls").
- Confirm that the checks have been carried out by signing the transfusion form.

Administration of a Blood Transfusion

- A transfusion of red blood cells should commence within six hours of removal of the unit from a refrigerator. The transfusion of a unit of red blood cells should be completed within six hours from the start.
- If a red blood cell product has been at room temperature for two hours, it must not be returned to a refrigerator for storage but it must either be transfused (see above) or discarded and returned to the blood bank for writeoff (according to the local practice).
- Before starting a transfusion check the patient's vital signs (i.e., blood pressure, pulse and temperature).
- Transfusion of red blood cells may usually be commenced immediately after the product has been taken out of refrigerator.
- If the patient has significant cold agglutinins, red blood cell products should be warmed during transfusion with an approved commercial blood warmer. The temperature must not exceed +37 degrees C due to the risk of haemolysis.
- A blood administration set with a 200 micrometer filter (the drip chamber containing a large filter) should be used to transfuse all blood products (red blood cells, platelets, fresh frozen plasma).
- A biological pre-check is recommended at the beginning of a red blood cell transfusion; the red cells are transfused slowly (10 to 15 drops/min) during the first 10 minutes whilst carefully observing the patient. Procedure in suspected adverse reaction to the transfusion, see the Finnish Medical Society Duodecim guideline "Adverse Effects of a Blood Transfusion and Administration of a Wrong Blood Product". The patient must be monitored throughout the entire transfusion.
- The same administration set may be used to transfuse several units of red blood cells without interruption (according to the capacity of the administration set filter), but it is recommended that the administration set is changed after six hours in order to reduce the risk of bacterial contamination.
- It is recommended that platelets are administered via a special platelet administration set.
- Record the start and end time of the blood product transfusion in the patient's notes and confirm the completion of transfusion with your signature. This will ensure the blood product may be traced back from the patient to the donor and vice versa.

Related Resources

Refer to the original guideline document for related evidence, including Cochrane reviews and other evidence summaries.

Definitions:

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CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate selection and administration of blood and blood products to patients with symptomatic chronic anemia or acute bleeding

POTENTIAL HARMS

- Bacterial contamination of blood or blood products
- Transfusion reactions
- Graft-versus-host reaction

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Mar 30 (revised 2008 Jan 10)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Author: Sinikka Koskinen

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

This guideline is included in "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on December 17, 2002. The information was verified by the guideline developer as of February 7, 2003. This summary was updated by ECRI on July 15, 2004 and on December 21, 2006. This summary was updated by ECRI Institute on September 30, 2008.

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Date Modified: 11/3/2008